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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/977,410	10/15/2001	Lyndon W. Graham	SEM4492P0102US	4366

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EXAMINER

LEADER, WILLIAM T

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 03/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/977,410

Applicant(s)

GRAHAM ET AL.

Examiner

William T. Leader

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 December 2004.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 35-38 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 35-38 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

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### DETAILED ACTION

1. Upon review of the record of this application, the final rejection is withdrawn.

#### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 35 and 38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

4. Applicant copied claim 35 from claim 1 of patent 6,132,587, Jorne et al. The Jorne et al patent is directed to the uniform electroplating of wafers. Various embodiments of plating apparatus are shown in the figures. One embodiment is shown in figure 1. This embodiment includes porous separator 8. In the embodiment shown in figure 3, the apparatus additionally includes distributor 21 which has many holes 22.

5. In applicant's Remarks of October 15, 2001, applicant indicates that support for the claim 35 limitation "a non-conducting porous separator between said wafer holder and said counter-electrode" is found at page 21, lines 23 through page 22,

line 2 of applicant's specification which describes diffusion plate 375. Applicant additionally copied claim 38 from the Jorne et al patent. Claim 38 recites the limitation "a distributor positioned in said reservoir including a disk having a plurality of holed adapted to provide a flow of electrolyte through the disk that is uniform along a radius of the disk." Again, in the Remarks of October 15, 2001, applicant points to the description of diffusion plate 375 as providing support for this claim limitation.

6. The Jorne et al patent does not define "porous" or "hole". In the event a term is not given a particular meaning by an applicant, the conventional dictionary definition is used. The American Heritage Dictionary, New College Edition (1976) defines "porous" as "possessing or full of pores". A "pore" is defined as "a minute opening" or "a small interstice admitting adsorption or passage of liquid". "Hole" is defined as "a cavity in a solid". Based on these different definitions, "porous" or "pores" are not considered to be synonymous with the term "hole".

7. Jorne et al characterize elements 8 and 21 differently. As noted above, element 8 is called a porous separator while element is described as a distributor with holes. In the figures, the cross sections of these elements are represented differently. Based on the distinct use in Jorne et al of the terms "porous" and "holes", it is concluded that Jorne et al meant to describe different structure with these different terms. Consequently, a porous separator is considered to be structurally different that a distributor with holes.

8. Applicant has relied on the description of element 375 as shown in figure 8 to provide support for both the limitations of claims 35 and claim 38. Figure 8 shows the diffusion plate as having distinct holes. This structure, and the description in applicant's specification, is considered to correspond to distributor 21 with holes 22 of Jorne. It is not considered to describe element 8 of Jorne et al or to provide basis for the copied claim language of claim 35.

9. Applicant copied claim 38 from claim 19 of patent 6,132,587, Jorne et al. The last portion of the claim recites the limitation "a distributor positioned in said reservoir including a disk having a plurality of holes adapted to provide a flow of electrolyte through the disk that is uniform along a *radius* of the disk" (emphasis added). In the Remarks of October 15, 2001, applicant indicates the basis for this limitation is found at page 21, line 23 through page 22, line 2 which state "Fig. 8 also shows a diffusion plate 375 provided above the anode 334 for providing a more even distribution of the fluid plating bath across the wafer W." The portion of the specification relied on makes no mention of flow which is uniform along a *radius* of the disk. Clearly, flow may be measured in directions other than along a radius, for example, along a chord of a circular article. Apparatus for electroplating wafers which includes a distributor positioned in a reservoir including a disk having a plurality of holes adapted to provide a controlled flow of electrolyte to provide uniform plating across the wafer were known in the art before the patenting of Jorne. See, for example, Grandia et al (4,304,641) which discloses apparatus with

distributor plates having particular configurations of holes to provide for uniform plating thickness. Not all such apparatus or all variations of holes provide flow which is uniform along a radius as recited by Jorne et al.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claim 36 is rejected under 35 U.S.C. 102(b) as being anticipated by Mori (5,443,707).

12. The Mori patent is directed to apparatus for electroplating a semiconductor substrate. The apparatus is illustrated, for example, in Fig. 6 and includes a reservoir 101 for electrolyte, a holder 106 adapted to hold a wafer above the reservoir, a concentrically located counter-electrode 110 in the reservoir, means for passing current between the counter-electrode (column 3, lines 47-50), and a pump adapted for pumping electrolyte from the reservoir against the wafer (column 3, lines 38-41). Mori teaches that the counter-electrode should have a diameter no larger than one third of the diameter of the main surface of the cathode wafer holder (claim 1). All elements recited in claim 36 are taught by Mori.

13. Claim 37 is rejected under 35 U.S.C. 102(b) as being anticipated by Murata (5,228,966).

14. Applicant has indicated that claim 37 has been copied from claim 5 of the Jorne et al patent. As presented by applicant, claim 37, line 10 lacks the limitation "pulsed" in Jorne et al's claim 5 limitation "means for applying pulsed current to said pump during the electroplating process." The Murata patent teaches all limitations in claims 37 as presented by applicant. As shown in figures 1 and 2, the apparatus of Murata includes a reservoir 2 for the electrolyte, a head member 10 with cathode 4 which in combination with support 18 hold the wafer above the reservoir, a counter-electrode 5 in the reservoir, means for passing current (column 2, lines 61-63), and pump 9 along with means for providing electric current to the pump so that the pump can perform the function of jetting the electrolyte through the anode counter-electrode (column 2, lines 49-52).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 571-272-1244. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*WL*

William Leader  
February 16, 2005

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